



*Spray line showing how well the aerial application method works on removing nonnative invasive species*

@ORC

Issue # 41  
July 21 , 2015

## Aerial Application for the Removal of Honeysuckle and Other Invasive Species

*By Bob Caveny, Private Lands and Watersheds*

Nonnative invasive species (NNIS) have become an increasing problem for many areas of the state. Heavy infestations of Bush Honeysuckle, Japanese Honeysuckle, Garlic Mustard, and Russian/Autumn Olive have choked out native vegetation across millions of acres in Illinois. One major obstacle in managing these acres is the cost to remove these species and the man power and time typically involved in these processes. With limited budgets, both state agencies and private landowners can rarely afford to conduct many acres of these expensive and labor intensive treatments on their properties.

In order to manage a large amount of acreage, a better means of eradication is needed to allow the native species to rebound. In 2009, the Missouri Department of Conservation (MDOC) began to do test spraying bush honeysuckle from the air. This method allows for

quick delivery over a large area while using the plants natural life cycle to make it vulnerable.

MDOC used multiple methods, including fixed wing aircraft and helicopters, to spray forested acreage after the majority of native plants are in dormancy and the oaks have lost their leaves. This is the best time for this type of treatment because honeysuckle, olives, garlic mustard, and the stems of multiflora rose are still actively photosynthesizing for a couple weeks after the bulk of native vegetation has gone into dormancy. There are some native species still photosynthesizing at this time as well, including Christmas ferns and some sedges, but most native plants are in dormancy.

During this short duration, before the NNIS that are actively photosynthesizing lose their leaves,



Bob Caveny, began his career with IDNR in April 2014 as the Conservation Stewardship Manager. Prior, Bob was the Illinois Recreational Access Coordinator for the Sangamon Co. SWCD. He also worked as a Regional Wildlife Biologist and Farm Bill Biologist for Pheasants Forever in Indiana and eastern Illinois, respectively. Bob has a BS degree from EIU and a MS degree from Texas A&M University in Wildlife Biology.

@ORC is a weekly publication by the IL Department of Natural Resources Office of Resource Conservation about exciting and wonderful things ORC staff are doing throughout Illinois.

Tammy Miller, Editor  
tammy.miller@illinois.gov



is the window of opportunity for landscape scale eradication. In this short time period, large amounts of acreage can be sprayed using glyphosate to help manage the infested acres. So far, the results have been promising.

MDOC developed a study on 2 of their conservation areas in eastern Missouri. They developed random sampling units in areas of high and low bush honeysuckle (BH) concentrations, as well as control plots. For this, they set up 40 m<sup>2</sup> plots for both the spray and control units. They collected data that included BH stems greater than 1cm at 6" above ground, foliar cover, over story trees, other plants within the plot, and BH seedlings per plot. They sprayed areas during the fall of 2009 and 2013.

The 1<sup>st</sup> year (2009) MDOC completed aerial application; they used a fixed wing aircraft to deliver 3 quarts/ac of Roundup Pro (5 gallons/ac total). They achieved a 85% kill on bush honeysuckle in their test units, all for \$54/ac. After the initial application, the MDOC switched to Rodeo (or equivalent) in an attempt to be environmentally friendly for the reptiles and amphibians that still may be active this time of year.

In the 2<sup>nd</sup> study they used a helicopter for spraying. They delivered 15 gallons/ac of solution using 3.75 quarts of Rodeo plus LI 700 and drift retardant. The areas that were sprayed had nearly 80% defoliation and a 46% kill. The kill rate is reflectively low because one leaf on any stem that was counted in the plot is counted as alive. However, many of



Aerial Spraying of NNIS - Photo by Mike Leahy, MDOC

these leaves were small and sickly from the spray The previous year. This treatment costs MDOC around \$130/ac. MDOC has continued to test their survey plots in subsequent years, and finding that many of the sickly plants have died 2 years after the initial treatment. MDOC was unable to spray in the fall of 2014 due to weather conditions at their sites, but are going to monitor all survey points again this spring/summer.

In the fall of 2014, staff from the Illinois Recreational Access Program (IRAP), in conjunction with the US Fish and Wildlife Service (USFWS), set up 2 test sites in Macoupin County, IL. On 1 site, 15 random sampling points were placed on the property to test the effectiveness of aerial spraying. Within each 40 m<sup>2</sup>, data collected included BH stems greater than 1cm at 6" above ground, foliar cover, and noted over story trees and other plants within the plots. Stakes were placed at the corners of each plot in order to be able to find the plots over the next couple of years.



Honeysuckle before spraying on Oct. 31, 2014 (left) Same honeysuckle after spraying on April 21, 2015 (right)







Many woodland flowers appeared in the spring after the fall aerial spraying. Some found were Dwarf Larkspur (left), Shooting Star (center) and Violet Wood Sorrel (right)

Both properties were sprayed from a fixed wing aircraft on Nov 7, 2014. IRAP used 3 quarts/ac of Rodeo in water. The temperature that day was 55 degrees with a wind speed of less than 4 mph. Over 75% defoliation was recorded within the test plots, with over a 60% kill. Many of the plants that were counted as alive had small retarded leaves on them as well and are unlikely to make it to next year. There was also a dramatic decrease of Japanese Honeysuckle (JH) within the stand. The majority of the JH that was in the mid-story and canopy was completely killed. Some of the JH that was on the ground survived due to canopy coverage above it, mainly of BH. The cost for fixed wing spraying on these properties was \$38/ac.

While doing the post vegetative sampling, a large number of native species were documented on the property. There were trout lilies, shooting stars, and a variety of other native vegetation that began to sprout after the canopy cover was removed in the areas. The oaks and other native species had also begun to leaf out. The multiflora rose was hurting, but the majority of it had leafed out as well.



Native bluebells abound on the forest floor after removing NNIS

IRAP intends to expand the current study design to several more properties throughout the state to test the effectiveness of aerial spraying for NNIS removal. This summer IRAP staff will be placing random test plots on several IRAP properties throughout central Illinois and will measure the same parameters as before on the previous sites.



Staff head out to survey results from last fall's aerial spraying on property in Macoupin county. From left to right, Andrew Diallesandro, (USFWS), Phil Cox and Jake Vancil, (IRAP Coordinators with Sangamon Co. SWCD), and Bob Caveny, (IDNR)

Although IRAP had great success with aerial spraying last fall in stands that had a heavy NNIS infestation, caution needs to be exercised in areas of low concentration or areas that have a large population of native vegetation that is active during the application. Native sedges and Carolina buckthorn were negatively impacted in the MDOC studies, but most did rebound the year following the spraying. Spraying large amounts of chemical on saplings may also be detrimental to those species, but that has yet to be recorded in the MDOC or IRAP studies.



A flag marks the boundary of a survey plot (left). Measuring the diameter of a bush honeysuckle stem (right)





A helicopter is "refueling" with a mix of chemicals and water before beginning aerial spraying of NNIS

Although anti drift agents are added to the mix, drift likely will be an issue on properties as well, especially on smaller acreages. All surrounding landowners will need to be notified of such spraying taking place as well. Aerial spraying may alarm neighbors to the property if they are unaware, and they may think that their homes are being dive-bombed (true story).

A last consideration should be that the best time to spray is during the peak of hunting season, especially archery deer hunting. Hunters that may utilize the property will need to be informed to stay away from the property on the day of application so they do not get covered in chemical.

This type of treatment will not be a cure all to all of our management needs across the state, but by reducing the amount of live honeysuckle by over 60% on many properties would make it more likely that follow up treatments could help eradicate these species. IRAP has also started to test the effectiveness of prescribed burning on the properties following the initial application, but it will take some time to determine if this is helping out with the current management.

On the ground follow up treatments will have to take place on the properties to ensure eradication, but by reducing the amount to be treated by spot spraying dramatically reduces the cost of conducting such treatments. With a reduced cost, more acres can be treated with multiple treatments to promote

native vegetation. IRAP will continue to test this on properties in hopes of finding cost effective ways to control NNIS on landscape scales.

### Consideration and Conclusions

- Works best for heavy infestation
- May want to avoid low infestation sites that have lots of native plants active at during that time.
- Will need to mitigate for drift issues and let neighboring landowners know what is going on.
- Will need to watch toxicity for reptiles and amphibians as well as doses on stems of good trees, especially saplings.
- Many heavy infestations do not have any diversity under them.
- Instant response to additional sunlight by native species
- At this point, aerial spraying seems to be a very cost-effective and less labor intensive method for removing several NNIS species. .

